

every ported subscriber is much more laborious than traditional 3 (NPA) or 6 (NPA-NXX) digit translations. In the second work-around, STPs would continue to use non-ten digit translations, but would be translated to route CLASS messages to a service provider portability database rather than end office. In this case, the service provider portability database would route these CLASS messages to the correct end office, eliminating the need for laborious ten digit STP translations.

Time Warner does not believe that the CLASS/STP translation issue is an excuse for not providing portability.

There are several disadvantages to the MCImetro solution:

First, since each service provider would consume a CPC in each NPA in each LATA in which they offer service, the usage of CPCs might contribute to telephone number exhaust. Second, CPC translations at each switch can require as much effort as administering a new NPA. This requires more effort than other solutions where new NXXs are translated within already existing NPAs. Third, since the CPC routing address contains the ported subscriber's seven digit number, the CLEC is forced to assign their subscriber in the end office dedicated to the subscriber's NXX. With other solutions, like LRN, the portability database merely returns a location routing number which can correspond to any of the CLEC's switches, allowing the CLEC to offer location portability. Finally, CPC solutions using AIN makes other AIN services offerings using the same trigger impossible. The end office detecting a 3/6/10 digit trigger can send only one query to a database -- that query can be either a service provider portability query or an AIN service query, but not both. If the trigger is used for portability, it cannot be used for revenue generating products.

#### **AT&T LRN**

The AT&T Location Routing Number (LRN) approach offers perhaps the most robust solution for the future. In the LRN solution, when an end office detects that a call is being placed to a ported number it will send a query to a service provider database. The response from the database will instruct the end office to route the call to a Location Routing Number, which is a number assigned to a single CLEC end office. When the CLEC end office receives the call, it will examine the SS7 call setup message to determine the subscriber receiving the call.

Like MCImetro, LRN offers the same single number advantages. Another advantage to LRN is the use of a new AIN service provider portability trigger. The new trigger does not have AIN feature interaction problems, like CLASS activation to ported DNs with 3/6/10 triggers. The new trigger frees up the 3/6/10 digit

trigger for revenue generating product use. A third advantage to the LRN solution is number exhaust impact. A switch serving ported subscribers is addressed by the Location Routing Number, which is a unique NXX within an existing NPA as known by the Local Exchange Routing Guide (LERG). Since a new end office must 'own' at least one new NXX anyway, there is no additional impact on exhaust over any other Service Provider Portability solution. Finally, the LRN solution allows the LEC or CLEC to offer location portability. Using the Location Routing Number, calls to the ported number can be routed to any end office regardless of the dialed number.

There are several disadvantages to LRN. The LRN solution proposes changes to SS7 call setup message parameters (i.e. the Generic Address Parameter), requiring acceptance by standards bodies. These changes are not guaranteed to be accepted by the standards bodies. Even if the standards changes were accepted, these changes would most likely not be available until 9-18 months after acceptance -- the 'time to market' is too long for Time Warner.

#### **Transitional LRN-like solution**

As an alternative to the LRN solution as specified by AT&T, a modified version of LRN is possible as a transitional solution. Like most other solutions, this solution is triggered at the N-1th carrier, either by an AIN or IN trigger. Upon receipt of a portability query, the portability SCP will instruct the end office to route the call to the CLEC's end office via the Location Routing Number. The portability SCP will also place the dialed number in some SS7 call setup parameter, like the Original Calling Party Number parameter. However, unlike the AT&T LRN solution, on receipt of the call, the CLEC's terminating office will again trigger on the call, and its SCP will examine the same SS7 call setup parameters used earlier in the call and will route the call to the dialed number -- in this case the contents of the Original Called Party Number parameter.

The advantages to the modified LRN solution are as follows: First, this solution can use AIN or IN triggers, allowing flexibility at the incumbent LEC end office. Second, the LEC or CLEC can offer location portability for the same reasons as the AT&T LRN solution. Third, the LEC and CLEC has less switch translations than other solutions like the MCImetro CPC solution, since CPCs do not have to be translated as NPAs. Fourth, this solution would provide for a transition to a true A&T LRN solution. Most importantly, this solution uses technology that is here and now and can be implemented in a very short time frame. It does not require standards changes nor additional trigger development.

The main disadvantage to this modified LRN solution is the use of two queries in order to route the call. This results in additional post dial tone delay.

#### **Seattle/U.S. Intelco**

The U.S. Intelco solution, also known as Local Area Number Portability (LANP) is different from the other solutions in that it uses two numbers for each ported subscriber: the subscriber's original number, and a new routing number known as a Network Node Address (NNA). The NNA is used for call routing number as follows: When an end office detects a call to a ported number, the end office will send a query, either through the use of an AIN or IN trigger, to a service provider portability database. The database will then instruct the end office to route the call to the subscriber's NNA. Upon receipt of the call, the CLEC end office will merely terminate the call to the subscriber's line, which is assigned the NNA. When the ported subscriber originates calls, the CLEC end office will need to ensure that the original subscriber's number (not the NNA) is used for the subscriber's calling party number and billing number.<sup>2</sup>

First, this solution can use AIN or IN triggers, allowing flexibility at the incumbent LEC end office. Second, the LEC or CLEC can offer location portability for the same reasons as the AT&T LRN solution. Third, the LEC and CLEC has less switch translations than other solutions like the MCImetro CPC solution, since NNAs do not have to be translated as NPAs. Although it may appear that two numbers worsens the exhaust issue, this is not the case. The LANP solution allows unused numbers to be freed up. In today's situation, the entire NXX block of numbers is tied up even if only one number is used. With LANP, all of the other numbers in the NXX block would be free for assignment. Therefore, LANP actually helps the number exhaust issue. Most importantly, this solution uses technology that is here and now and can be implemented in a very short time frame.

There are disadvantages with LANP. When ported subscribers originate calls, some switches have difficulty assigning the subscriber's original calling party number and billing number for calls. This was verified with U.S. Intelco testing -- AT&T 5ESS switches had difficulties. In addition, some switches may not have enough memory available for translations because unlike other solutions, with LANP (to be most effective), both the subscriber's original number and the subscriber's NNA must be

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<sup>2</sup> SS7 call setup messages include the caller's calling party number and billing number. The CLEC end office originating calls needs to insert the subscriber's original number in these call setup messages.

translated on the CLEC's switch. Finally, operations systems may have a greater impact with the dual numbering approach with LANP than with single numbering approaches like LRN or MCImetro CPC.

## **GTE**

The GTE solution requires that each ported subscriber make a one time number change. Time Warner cannot accept service provider "solutions" that require number changes.

## **ANALYSIS OF SO-CALLED INTERIM SOLUTIONS**

### **Remote Call Forwarding (RCF)**

The RCF limitations are as follows: First, RCF uses two numbers (without freeing any other numbers) and does not ease telephone number exhaust. Second, RCF is inefficient in trunk utilization because there is no capability to route the call to an alternate destination by an interexchange carrier. Third, RCF allows the incumbent LEC to collect access revenues for interLATA calls, removing the CLEC from these earnings. Finally, RCF does not function properly with switch-based features. The following table shows the limitations of using RCF with various switch based features (NO implies that the feature will not function properly):

<b>RCF SOLUTION</b>			
	<b>ported user calling non-ported user</b>	<b>non-ported user calling ported user</b>	
<b>Distinctive Ringing</b>	NO <sup>2</sup>	OK	NO <sup>2</sup>
<b>Caller ID</b>	NO <sup>2</sup>	OK	NO <sup>2</sup>
<b>Customer Originated Trace</b>	OK <sup>1</sup>	OK	OK <sup>1</sup>
<b>Selective Call Forwarding</b>	NO <sup>2</sup>	OK	NO <sup>2</sup>
<b>Selective Call Rejection</b>	NO <sup>2</sup>	OK	NO <sup>2</sup>
<b>Long Distance Call Waiting</b>	OK	OK	OK
<b>Anonymous Call Rejection</b>	OK	OK	OK
	<b>ported user activating to non- ported user</b>	<b>non-ported user activating to ported user</b>	<b>ported user activating to ported user</b>
<b>Automatic Recall</b>	OK	NO <sup>3</sup>	NO <sup>3</sup>
<b>Automatic Call Back</b>	OK	NO <sup>3</sup>	NO <sup>3</sup>

- 1 - COT information will be recorded under the forward-to DN, not the original dialed number.
- 2 - CPN will be new forward-to DN, not ported number.
- 3 - The 5ESS cannot perform feature activation to Call Forwarded DN.

**b) DID**

The DID limitations are as follows: Like RCF, DID is inefficient in trunk utilization. DID allows the incumbent LEC to collect access revenues for interLATA calls, removing the CLEC from these earnings. Using MF trunks, DID does not allow CLASS features to function properly. CLASS features require SS7, which is not available for DID trunks. Using MF trunks, DID has slower call setup times than SS7 trunking. Call setup delay is even worse with enhanced versions of DID that route calls through an Access Tandem. Given this analysis, DID gives the incumbent LEC a significant advantage over CLECs.



## **APPENDIX C**

## **CURRENT/PLANNED TRIALS IN WHICH TWCOMM IS INVOLVED**

### **New York**

Ten companies (AT&T, Cellular One/Genesee Telephone Company, LOCATE, MCI, MFS Intelenet, Inc., NYNEX, Rochester Telephone Corp., Sprint Communications Company L.P., Teleport Communications Group, and Time Warner Communications) in conjunction with the New York Public Service Commission (NYPSC) solicited proposals from manufacturers/providers of network database-driven Local Number Portability (LNP) architectures, for use in exploring the feasibility of a multi-company LNP trial. The trial will begin on or about February 1, 1996 following the approval of the NYPSC.

Two providers were selected via Request for Proposal evaluation process: MCImetro for a Carrier Portability Code (CPC) solution in Manhattan, and U S Intelco/Stratus for a Local Area Number Portability (LANP) solution in Rochester, New York.

Phase 1 will port numbers from dedicated, unused NNXs.

Phase 2 will expand the trial to a limited number of NNXs in general use. Telephone numbers from trial participants' administrative offices will port from one local service provider to another.

Phase 3 will serve customers served by interim number portability arrangements (remote call forwarding) via the LNP trial capability.

### **Manhattan**

NYNEX has elected to accommodate the CPC trial with AIN 0.1 triggers from their Manhattan switches. MCImetro, Time Warner, NYNEX, TCG, and MFS will have class 5 end offices in the trial topology; all are served via the NYNEX 37th street access tandem. AT&T, MCI, and Sprint will interface for interexchange carrier traffic; STPs owned by AT&T, MCI, NYNEX, Sprint, ITN and MFS will interface signaling links. MCImetro will provide the LNP SCP data base, but AT&T, MCI and Sprint may have copies of their own data base. The trial will impact Line Identification Data Bases (LIDB) for all carriers involved; the scope of the impact is unknown at this time. All class 5 end offices will carry operator services and 911 traffic. (The Manhattan area will have E911 via 2 tandems as of 10/31/95.)

MCImetro will complete test plans by 11/1/95, and have data base equipment and access lines installed by 11/27/95. Training will complete by 1/27/96.



Trial Phase 1 will begin 2/1/96 and complete 3/22/96. Phase 2 will begin 3/25/96, end 5/31/96; and Phase 3 begins 6/3/96, ends 8/14/96.

The trial team will develop a cost model for the widespread deployment of this LNP method after the conclusion of Phase 3. The post trial activities are scheduled to be completed by 1/15/97.

### **Rochester**

The technical team is currently defining the trial network topology. Participating companies: MFS, Time Warner, Rochester Telephone, Cellular One, Sprint, AT&T, MCI.

Trial Network Design Document Complete: 10/18/95

Trial System Design Document Complete: 10/18/95

Trial Network Development Complete: 11/20/95

Trial System Development Complete: 11/20/95

Pre-Trial Testing and Training Complete: 1/5/96

Phase 1: 2/1/96 through 3/29/96

Phase 2: 4/1/96 through 5/31/96

Phase 3: 6/3/96 through 7/31/96

Post-Trial Report and Cost Model Completion: 8/31/96

### **Illinois**

The Illinois Commerce Commission has hosted a workshop for carriers operating networks in Illinois to explore and define LNP issues. This team developed a framework requirements document that outlines requirements for an LNP architecture solution in Illinois. AG Communications/ITN, USIntelco/Stratus, AT&T, MCImetro, and Nortel responded to the requirements document with formal presentations in Chicago during the week of 8/14/95. This team will select an architecture for deployment on 9/7-8/95.

AG Communications presented a dual number approach, USIntelco/Stratus presented LANP interworking with various other vendor solutions, AT&T presented LRN, MCImetro presented CPC, and Nortel presented Look Back.

The workshop created subcommittees to explore SMS, Rating and Billing requirements.

## **Florida**

The Florida Public Service Commission hosts a Number Portability Standards Group to determine the appropriate parameters, costs and standards of number portability as directed by Florida Statutes. This team is just now assembling.

## **Ohio**

Since MFS has been granted the approval to provide local access in Ohio, the Ohio Commission has expressed an interest in exploring LNP requirements issues. No specifics as of this writing.